PATENT COOPERATION TREATY

PCT

REC'D 14 JUL 2004 WIPO PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P15087WO	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE2003/000534	International filing date *(day/month/year)* 02/04/2003	Priority date *(day/month/year)* 03/04/2002
International Patent Classification (IPC) or national classification and IPC H04B 7/005, H04L 1/00		
Applicant Telefonaktiebolaget L M Ericsson et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 2 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
06-10-2003	28-06-2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Nabil Sebaa /LR Telephone No. +46 8 782 25 00

Form PCT/IPEA/409 (cover sheet) (January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/SE2003/000534

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

☐ the international application as originally filed/furnished

☒ the description:

pages 1-2,4-19 as originally filed/furnished
pages* 3-3a received by this Authority on 19/03/2004
pages* _____ received by this Authority on _____

☒ the claims:

pages 20-24 as originally filed/furnished
pages* _____ as amended (together with any statement) under Article 19
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____

☒ the drawings:

pages 1-5 as originally filed/furnished
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing *(specify)*: _____
☐ any table(s) related to the sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing *(specify)*: _____
☐ any table(s) related to the sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/SE2003/000534

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-15	YES
	Claims		NO
Inventive step (IS)	Claims	1-15	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-15	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

List of documents cited in the International Search Report:

D1: US 5982766 A
D2: US 5345598 A
D3: US 6134220 A
D4: WO 0195548 A1
D5: WO 0193471 A1

The claimed invention relates to methods and systems for controlling transmitter power control in radio communications systems. The problem dealt with by the claimed invention is capacity loss in a radio communication system, due to that in a mobile to mobile call with one good and one bad radio link, the good radio link is forced by the poor link to use a more robust mode and thereby using excessive power. Additional problems to be solved by the claimed invention are to reduce interference level in a radio communication system, and to decrease battery drain in mobile stations in order to extend talk time.

The claimed invention according to independent claim 1 describes a method for controlling the transmitted power in a radio communication system comprising two mobile stations and two base stations. According to the method, a first mobile station is communicating in an uplink direction (UL1) with a first base station using an uplink power; whereas the second base station is communicating with a second mobile station in a downlink connection (DL2) using a downlink power. For the first uplink direction, the first base station requests a first AMR (Adaptive Multi Rate) code (AMR1) being associated

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

with a first C/I (Carrier to interference) ratio. For the second downlink connection, the second mobile station requests a second AMR code (AMR2) associated with a second C/I radio.

Based on these two requests, and their associated C/I ratios, either the uplink power or the downlink power is adjusted to a power level lower than power level associated with the highest calculated C/I ratio. Thus, the most robust mode is selected and therefore, the power of the strongest signal, i.e. the highest C/I ratio is adjusted (decreased).

Document D1 describes a combination of AMR codes and transmitter power control in a radio communications system (see abstract, and figures 3, 11-15 in D1). The aim of D1 is similar to the one of the claimed invention, i.e. to reduce the interference level without loss in capacity in a radio communication system (see column 1 lines 30 - 42). According to D1, each source signal class have several modes with different channel protections. The transmitter power is adjusted based on the source signal and changes in the radio environment. Further, the effect of combined mode switching and output power adjustment is to decrease the speech quality for the channel that is less protected i.e. the one with the strongest C/I ratio (see column 8, lines 34 - 50). The procedure of reducing the transmitter power based on radio conditions and selected AMR codes are described in details in column 7, line 10 - column 8, line 15. D1 however does not suggest a solution of combining mode switching and output power control for a mobile to mobile connection, with one good and one bad link, and to adjust either the uplink or downlink power to a power level lower than power level associated with the highest calculated C/I ratio.

Therefore, the claimed invention according to independent claim 1 is not considered obvious to a skilled in the art, and the invention defined in claim 1 is novel and is considered to involve an inventive step.

The method described in claim 2 is similar to the one described in claim 1 with the slight difference that the uplink or downlink transmitter power is adjusted to a power level lower than power level associated with highest AMR coded mode request. The arguments presented above on claim 1 are

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

therefore valid for this claim since the highest AMR code is associated with the highest C/I ratio. Therefore, the claim invention according to claim 2 is considered novel, to involve an inventive step and to be industrially applicable.

In addition, the invention defined in remaining claims 10-15 is also novel and is considered to involve an inventive step. The invention is industrially applicable.

The remaining cited documents D2-D5 represent the general state of the art.

The invention defined in claims 1-15 is not disclosed by any of these documents and the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-15 is novel and is considered to involve an inventive step. The invention is industrially applicable.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In the independent claims of the claimed invention, the term optimal is used to describe the power to be adjusted to. It is not clear what is meant by optimal in these claims and therefore it is recommended to elucidate, elaborate on, and clarify the term optimal, or completely omit the wording optimal in the independent claims.

On page 4, lines 19 - 20, it is stated that the problem is solved by systems according to claims 10-13. Since only claims 10-11 are independent claims describing systems, it is recommended to replace the wording claims 10-13 on page 4, line 20 by the wording claims 10-11.